

MERGE TIME SERIES OPERATION

Identifier: MERGE-TS

Application: All programs

Description: This Operation allows selection between time series with the same information from different sources. There are two cases included:

- Case 1: Merges an unlimited number of input time series to produce a single output time series. In general, the input time series can contain missing values.
- Case 2: Specifies two precipitation or instantaneous discharge time series, with no missing values, in a preferred order. At run time the SWITCHTS MOD can be used to reverse the order for specified time periods, thus merging the two time series.

A more complete description of each case is as follows:

Case 1: Case 1 of the MERGE-TS Operation merges an unlimited number of input time series and produces a single output time series. Input time series are entered according to a user-assigned rank. Every value moved to the output time series is from the highest ranking input time series that has a value. The primary time series is always moved to the output time series. The Operation determines whether or not missing data are allowed in the output time series.

The following rules apply to case 1 of this Operation:

1. All time series must have the same time interval. More than one value per time interval is allowed.
2. All time series must have the same units and dimensions.
3. The first (primary) input time series must allow missing data.
4. Only the last input time series may be of the no-missing data type.
5. If the output data type does not allow missing data, then the last input time series must be of the no-missing data type.
6. The output time series may be defined the same as the primary input time series, but not any of the other subsequent time series.

Case 2: Case 2 of the MERGE-TS Operation switches between a

primary and secondary input time series at run time. The time series switch applies for a time interval specified in the SWITCHTS run-time modification. No missing data is allowed in the primary, secondary, or output time series, and only two input time series are permitted. The time series must be specified as precipitation with dimensions L and internal units of mm, or instantaneous discharge with dimensions L3/T and internal units cms. For example, the user can switch between time series MAP and MAPX, or between QINE and SQIN.

The following rules apply to case 2 of this Operation:

1. All time series must have the same time interval. More than one value per time interval is not allowed.
2. All time series must have the same units and dimensions.
3. The output, primary (input) and secondary (input) time series must not allow missing data.
4. Only two input time series are allowed with case 2.
5. The output time series may be defined the same as the primary input time series, but may not be defined as the secondary input time series.

Allowable Time Intervals: 1, 2, 3, 4, 6, 8, 12 and 24 hours

Time Series Used: Time series used in this Operation are as follows:

Case 1:

General Type	Dimn	Units	Use	Required	Form of Output T.S.	Data Time Interval	Missing Values Allowed
Output	any	any	O	yes	Replaces	any	yes
Input	any <u>1</u> /	any <u>1</u> /	I	yes	N/a	any <u>1</u> /	yes <u>2</u> /

1/ Input time series information must match output time series information.

2/ All input time series, except the last one, must allow missing values. The first input time series must always allow missing values. The last input time series must not allow missing values if the input time series does not allow missing values.

Case 2:

General Type	Dimn	Units	Use	Required	Form of Output T.S.	Data Time Interval	Missing Values Allowed
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Output	<u>1</u> /	<u>1</u> /	O	yes	Replaces	any	no
Primary	<u>2</u> /	<u>2</u> /	I	yes	N/a	any <u>2</u> /	no
Secondary	<u>2</u> /	<u>2</u> /	I	yes	N/a	any <u>2</u> /	no

___1/ Data types must be either precipitation (dimn = L, standard units = MM) or instantaneous discharge (dimn = L3/T, standard units = CMS).

___2/ Must be the same as for the output time series.

Input Summary: The card input for this Operation is as follows:

<u>Card</u>	<u>Format</u>	<u>Columns</u>	<u>Contents</u>
1	I5	1-5	Number of time series to be merged
	2X,2A4	8-15	Output time series identifier
	1X,A4	17-20	Output time series data type
	I5	21-25	Output time series time interval
	4X,I1	30	Case option flag: 0 = case 1 (default value) 1 = case 2 and precipitation time series 2 = case 2 and instantaneous discharge
2	2A4	1-8	Input time series identifier
	3X,A4	12-15	Input time series data type

Repeat card 2 for each input time series in case 1. For case 2, the card 2 is for the primary time series, then repeat card 2 for the secondary time series. Only two time series are allowed in case 2.

Sample Input and Output: Sample input is shown in Figure 1. Sample output from the parameter print routine is shown in Figure 2. There is no execution routine output.

Error and Warning Messages: The error and warning messages generated by this Operation and the corrective action to take when they occur are as follows:

1. **ERROR** UNITS FOR THE INPUT TIME SERIES (ID = XXXXXXXX, DATA TYPE = 'XXXX') (XXXX) DOES NOT MATCH UNITS FOR THE OUTPUT TIME SERIES (XXXX)

Action: Units of all input time series must match those of the

output time series.

2. ****ERROR**** THE FIRST INPUT T.S. ALWAYS HAS TO ALLOW MISSING DATA FOR CASE 1 OF THE OPERATION.

Action: Check data type code of the first input time series to be sure that it allows missing data.

3. ****ERROR**** ONLY THE LAST INPUT T.S. MAY BE OF THE NO-MISSING DATA TYPE FOR CASE 1 OF THE OPERATION.

Action: Check that all time series proceeding the last input time series are associated with data type codes that allow missing data.

4. ****ERROR**** NO TWO INPUT TIME SERIES CAN HAVE THE SAME COMBINATION OF IDENTIFIER AND DATA TYPE.

Action: Check that every time series identifier and its associated data type code are unique.

5. ****ERROR**** THE OUTPUT TIME SERIES DATA TYPE XXXX CANNOT CONTAIN MISSING DATA. XXXX CANNOT BE CREATED FROM TIME SERIES WHICH CAN CONTAIN MISSING DATA FOR CASE 1 OF THE OPERATION.

Action: At least the last input time series must be of the no-missing data type.

6. ****ERROR**** THE OUTPUT TIME SERIES CANNOT CONTAIN MISSING DATA FOR CASE 2 APPLICATIONS.

Action: Check that output time series is of the no-missing data type.

7. ****ERROR**** THE PRIMARY AND SECONDARY INPUT TIME SERIES CANNOT CONTAIN MISSING DATA FOR CASE 2 OF THE OPERATION.

Action: Check that the input time series on input card number 2 are of the no-missing data type.

8. ****ERROR**** FOR CASE 2 THE OUTPUT TIME SERIES UNITS MUST BE OF DATA TYPE PRECIPITATION (DIMN=L, STANDARD UNITS=MM) OR INSTANTANEOUS DISCHARGE (DIMN=L3/T, STANDARD UNITS=CMS).

Action: Check the output data type on input card 1.

9. ****ERROR**** FOR CASE 2 THE INPUT TIME SERIES UNITS MUST BE OF DATA TYPE PRECIPITATION (DIMN=1, STANDARD UNITS=MM) OR INSTANTANEOUS DISCHARGE (DIMN=L3/T, STANDARD UNITS=CMS).

10. ****ERROR**** ONLY ONE VALUE PER TIME INTERVAL IS PERMITTED FOR OUTPUT TIME SERIES WITH CASE 2 APPLICATIONS.

Action: Check the number of values permitted for output data type.

11. ****ERROR**** ONLY ONE VALUE PER TIME INTERVAL IS PERMITTED FOR INPUT TIME SERIES WITH CASE 2 APPLICATIONS.

Action: Check the number of values permitted for input data type.

12. ****ERROR**** INPUT TIME SERIES NO. (XX) CANNOT HAVE THE SAME TIME SERIES IDENTIFIER AND DATA TYPE CODE AS THE OUTPUT TIME SERIES, FOR ANY CASE OF THE OPERATION.

Action: Check that the output time series identifier and data type code are defined differently from all input time series, with the exception of the primary input time series.

13. ****WARNING**** CASE OPTION FLAG (X) IN COLUMN 30 OF INPUT CARD 1 MUST BE SET TO 0, 1 OR 2. A DEFAULT VALUE OF 0=CASE 1, IS ASSUMED.

14. ****WARNING**** TWO INPUT TIME SERIES (PRIMARY AND SECONDARY) MUST BE SPECIFIED IN COLUMNS 1-5 OF INPUT CARD NO. 1 FOR CASE 2 APPLICATIONS. A DEFAULT VALUE OF 2 IS ASSUMED.

Action: Check to make sure that only two input cards No. 2 are used to input the primary and secondary time series to be switched.

Carryover Transfer Rules: This Operation has no carryover.

Punched Card Limitations: The values on the cards generated by the punched card subroutine should be identical to the original cards input for the Operation.

Figure 1. Sample Card Input For Operation MERGE-TS

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      5    10    15    20    25    30    35    40    45    50    55    60    65    70    75    80
-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
MERGE-TS      MAP
      2  KITM2POT MAPX      6      1
KITM2POT      MAPX
PETW2POT      MAP

MERGE-TS      QINE
      2  KITMMERG  QINE      6      2
KITM2POT      QINE
KITZTEST      QINE

MERGE-TS      STG
      2  KITMMERG STG      6      0
KITM2          STG
PETW2          STG

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Figure 2. Sample Output From Operation MERGE-TS Print Parameter Routine

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*****
MERGE-TS OPERATION      NAME=MAP      PREVIOUS NAME=
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MERGE TIME SERIES OPERATION

      2      TIME SERIES ARE TO BE MERGED
CASE 2:  2 T.S. WITH NO MISSING DATA FOR USE WITH THE SWITCH T.S. MOD

GENERAL TIME SERIES INFORMATION

      TIME INTERVAL (HOURS)                6
      VALUES PER TIME INTERVAL            1
      UNITS                                MM

OUTPUT TIME SERIES INFORMATION

      ID.                                KITM2POT
      DATA TYPE                          MAPX
      MISSING DATA ALLOWED               NO

INPUT TIME SERIES INFORMATION

      T.S. RANK      ID.      DATA      MISSING DATA
      TYPE           TYPE     TYPE        ALLOWED

      PRIMARY        KITM2POT  MAPX       NO
      SECONDARY      PETW2POT  MAP       NO

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